Sanitized Copy Approved for Release 2011/07/07 : CIA-RDP80-00809A000600241064-3

CLASSIFICATION CONFIDENTIAL CONFIDENTIAL

CENTRAL INTELLIGENCE AGENCY REPORT

INFORMATION FROM
FOREIGN DOCUMENTS OR RADIO BROADCASTS CD NO

50X1-HUM

COUNTRY	USSR - Moscow	DATE OF INFORMATION	1949
SUBJECT	Technology - Automobile engine manufacture		
HOW PUBLISHED	Monthly periodical	DATE DIST.	19 Aug 1949
WHERE PUBLISHED	Moscow	NO. OF PAGES	6
DATE PUBLISHED	Apr 1949		
LANGUAGE	Russian	SUPPLEMENT TO REPORT NO.	

THIS DOCUMENT CONTAINS INFORMATION AFFECTING THE NATIONAL DEFENSE OF THE UNITED STATES WITHIN THE MEANING OF ESPIONAGE ACT 50 U.S.C. 31 AND 32, AS AMENDED. ITS TRANSMISSION OR THE REVELATION OF ITS CONTENTS IN ANY MANNER TO AN UNAUTHORIZED PERSON IS PROHIBITED BY LAW. REPRODUCTION OF THIS FORM IS PROHIBITED.

THIS IS UNEVALUATED INFORMATION

SOURCE Avtomobil'naya Promyshlennost', No 4, 1949.

INSPECTION AT THE MOSCOW AUTO PLANT IMENI STALIN

K. P. Ivanov
Minister of Automobile and Tractor Industry USSR
Ye. M. Levenson
Moscow Auto Plant imeni Stalin

While the majority of enterprises producing machinery have sufficiently skilled technical personnel and a great deal of practical experience in planning and introducing technology in production, the technical control situation is often very poor.

Technologists are frequently inclined to consider technical inspection completely foreign to their field. Not having sufficient training in this subject, they sometimes attempt to transfer to the apparatus of the technical inspection section everything connected with inspection, artificially and incorrectly separating it completely from the technological process.

The experience of the foremost plants of the automobile and tractor industry, particularly that of the Moscow Automobile Plant imeni Stalin, gives a clear model on which to base the planning of technical inspection.

Planning the Technology of Inspection

A characteristic example of the way in which inspection should be carried out is given in the case of the cylinder block of the ZIS-120 engine. There are 97 operations in the production line. This, and large accumulations of product between operations, as well as the high cost of the part, make necessary the inclusion of a large number of intermediate inspection points in the technological process. In this case there are ten such points.

CONFIDENTIAL

CLASSIFICATION CONFIDENTIAL

STATE	X	NAVY	X	NSRB	DISTRIBUTION							
ARMY	X	AIR	X	FBI								

Sanitized Copy Approved for Release 2011/07/07 : CIA-RDP80-00809A000600241064-3

Sanitized Copy Approved for Release 2011/07/07 : CIA-RDP80-00809A000600241064-3

50X1-HUM

An inspection is made:

a. After the first 12 operations (grinding the base surface, boring and reaming the check bores, and milling operations), that is, before delivery of the block to the first automatic line;

b. After the 29th operation, that is, after the first and second automatic lines (boring the longitudinal oil canal, reaming, counterboring, cutting the threads in all the holes in the ends of the block and on the upper surface of the block);

c. After the 31st operation (testing the longitudinal oil canal under pressure) and before delivering the block to the third automatic line;

d. After the 44th operation (boring the cylinders) and before delivering the block to the fourth automatic line;

e. After the 59th operation (final accurate grinding of the cylinders);

f. After the 65th operation (testing the water jacket in a special hydraulic press);

g. After the 81st operation, that is after the final reaming of the bearings under the camshaft and accurate grinding of the main bearings;

h. After the 84th operation, that is, before adjusting and grinding the valves;

i. After the 92d operation, that is, after grinding the valves.

In each of the aforementioned operations of intermediate inspection, not only the dimensions between operations, but also the final dimensions are checked.

The last operation is to inspect the exterior, check the dimensions of the holes in the clutch housing, and the play of the cylindrical surface of the clutch housing relative to the axis of the main bearings. All the other dimensions and technical specifications of the plan for the cylinder block, which are checked with the aid of several dozen checking attachments and hundreds of gauges, have already been checked by the time the cylinder block is delivered for final inspection.

It is very important to fill in the flow sheets of intermediate and final inspection operations carefully and accurately.

Here is a simplified flow sheet of the machining and inspection of a spur gear.

Flow Sheet of the Machining and Inspection of a Spur Gear

[All dimensions are apparently in millimeters]

No of Operation	Name of Operation	Measuring Instrument
1	Reaming bore to diameter of 47	Slide gauge (Shtangen)
2	Broaching bore to diameter of 47.755-47.750	Plug gauge 47.775-47.750
3	Broaching keyway to dimensions 10.075-10.020 X 52.49-52.39	Plates: 10.075-10.020 1M-1599; 52.49-52.39 1M-1832

Sanitized Copy Approved for Release 2011/07/07 : CIA-RDP80-00809A000600241064-3

Sanitized Copy Approved for Release 2011/07/07 : CIA-RDP80-00809A000600241064-3

CONFIDENTIAL

50X1-HUM

(Continued)

No of Operation	Name of Operation	Measuring Instrument
4	Machining by lathe	Clip (Skoby) 30.2-30 1M-1840; 55.5-55.4 1M-3410; 178.35-178.09 1M-1833; 45.4-45.3 1M-1613
5	Removal of bevel edge	
6	Grinding outer face of rim to 30-29.72 (hold dimension to 55.3-55.2 and play of face to 0.1 or less)	Clip (Skoby) 30-29.72 1M-1834; 55.3-55.2 1M-1837; Mandrel gauge 11-275
7	Washing	
Inspection	Intermediate inspection (Checking 100%)	
	a. External inspection	
	b. Bore, 47.775-47.750	1M-1824
	c. Keyway, 10.075-10.020 X 52.49-52.39	1M-1599 1M-1832
	d. External diameter of rim, 178.35-178.09	1M-1833
	e. Distance between faces of hub, 45.4-45.3	1M-1613
	f. Distance between faces of crown (vents), 30-39.72	1M-1834
	g. Distance between outside faces of hub and rim, 55.3-55.2	1M-1837
	h. Play (biyeniye) of faces of hub to 0.1	11-275
	i. Play of faces of rim to 0.1	11-275
	Stamping acceptable parts	
8.	Milling (preliminary) of teeth z = 41	
9.	Turning sharp edges of teeth	
10.	Trimming projecting edges	
11	Cutting (final) of teeth z = 41, allowance for shaving of at least 0.08 and no more than 0.23 from maximum dimension with respect to center-to-center distance from calibrating gear, with a play of up to 0.1 with respect to pitch line and of up to 0.05 with respect to profile.	Checking device 1U-318. Calibrating gear 11-279

CONFIDENTIAL

Sanitized Copy Approved for Release 2011/07/07 : CIA-RDP80-00809A000600241064-3

Sanitized Copy Approved for Release 2011/07/07 : CIA-RDP80-00809A000600241064-3

(Continued) 50X1-HUM

No of Operation	Name of Operation	Measuring Instrument
12	Washing	
Inspection	Intermediate inspection Checking (of samples): a. External inspection b. Allowance for shaving of at least 0.08 and no more than 0.23 from maximum dimension with respect to center-to center distance from calibrating gear, with a play of up to 0.1 with respect to pitch line and of up to 0.05 with respect to profile.	1U-318 1I-279
13	Gauging bore (according to degree of necessity)	
14	Shaving teeth z = 41	Checking attachment 1U-318
	When meshing without clearance with calibrating gear which has thickness of tooth equal to 5.89 along curve of pitch cylinder in rated section (normal'noye secheniye), distance between centers must be 0.09-0.17 less than nominal, and must not vary more than 0.05 within one gear or more than 0.025 per tooth in turning.	Calibrating gear 1I-279
15	Washing	
Inspection	Intermediate inspection Checking: a. External inspection (100%) b. Meshing (100%) When meshing without clearance with a calibrating gear which has thickness of tooth equal to 5.89 along curve of pitch cylinder in rated section, distance between centers must be 0.09-0.17 less than nominal, and must not vary more than 0.05 within one gear or more than 0.025 per tooth in turning. c. Keyway, 10.075-10.020 X 52.49-52.39 (sample method) d. Noise and contact in meshing with calibrating gear (100%) Stamping serviceable parts (100%)	1U-318 1I-279 1M-1599 1M-1832 Speeder ST-1072 1I-280 1I-281
16	Heat-treatment	
17 - 18	Polishing teeth z = 41 a. Grinding outer face of hub; hold dimension to 55.15-55 and play of face to 0.05 b. Grinding bore to 48.027-48; hold play of pitch circle to 0.12 or less.	Clip 55.15-55 1M-3494; Mandrel gauge 1I-276 Plug gauge 48.027-48 1M-1835; Checking device 1U-318; Calibrating gear 1I-279

Sanitized Copy Approved for Release 2011/07/07 : CIA-RDP80-00809A000600241064-3

Sanitized Copy Approved for Release 2011/07/07 : CIA-RDP80-00809A000600241064-3

No. of Operation	Name of Operation	Measuring Instrument
19	Grinding internal face of the hub. Hold dimension to 45-44.83 and play of hub to 0.05 or less.	Plug gauge 45-44.83 1M-1836 Mandrel gauge 1I-276
20	Grinding teeth z = 41	
21	Washing	
22	Dressing teeth	
Inspection	Flying inspection for operations 1, 2, 3, 4, 6, 8, 9, 11, 14, 18, and 19.	
Inspection (23)	Final inspection Checking: a. External inspection, 100% b. Bore, diameter 48.027-48. 100%	1M-1835
	c. Keyway, 10.075-10.020 X 52.63-52.50, 100%	1M-1599 1M-1839
	d. Distance between faces of hub and rim, 55.15-54.85 (by sample method)	1M-1841
	e. Distance between faces, 45-44.83, 100%	1M-1836
	f. Play of faces of hub to 0.05 (by sample method)	1I-276 1U-318
	g. Meshing, 100%	1I-279
	When meshing without clearance with calibrating gear which has thickness of tooth equal to 5.89 along curve of pitch cylinder in rated section, distance between centers must be 0.05-0.21 less than nominal for all gears and must not very more than 0.12 within one gear. Variation of distance between centers when gear turns must not be more than 0.04.	
	h. For noise and contact in meshing with calibrating gear (sample method)	Speeder ST-1072 1I-281 1I-282

The design of the cylinder block of the ZIS-120 requires that the axes of the cylinders be within 0.05 millimeters perpendicular to the axis of the main bearings along the length of the cylinders. The cylinders are bored on the 43d operation, while the main bearings are machined on the 79th. Consequently, whether these axes are perpendicular to each other cannot be checked until after the 79th operation.

If the 43d oporation does not make the cylinder axes perpendicular to a base plane common to both operations, then all the processing between the 43d and 79th operations will have been done to no purpose and because of the large accumulations of product between operations large quantities of the part will be rejected. This will mean very large losses of material.

Sanitized Copy Approved for Release 2011/07/07 : CIA-RDP80-00809A000600241064-3

Sanitized Copy Approved for Release 2011/07/07 : CIA-RDP80-00809A000600241064-3

CONFIDENTIAL

50X1-HUM

Therefore, it is necessary to check (by the sample method) after the 43d operation to see that the axes of the cylinders are perpendicular to the base plane of the block. For this purpose a special device is used after the 44th operation.

An independent stationary checking device for the aforementioned between-operation checking after the 43d operation would be cumbersome, complicated, and very expensive. Before the war the Moscow Automobile Plant imeni Stalin had such a device for the block of the ZIS-5. In planning the equipment for the cylinder block of the ZIS-120, checking the block in intermediate inspection was improved and simplified: the same checking device was used in the 43d operation as in the 79th.

- E N D -

CONFIDENTIAL

Sanitized Copy Approved for Release 2011/07/07 : CIA-RDP80-00809A000600241064-3